

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 16

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

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Ex parte ROBERT CECIL BROOKS

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Appeal No. 2002-1359  
Application No. 09/323,990

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ON BRIEF

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Before MILLS, GRIMES, and GREEN Administrative Patent Judges.

MILLS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. §134 from the examiner's final rejection of claims 1, 4-7 and 11-13<sup>1</sup>, which are the claims on appeal in this application.

Claim 1 is illustrative of the claims on appeal and reads as follows:

1. A method for processing cells wherein an aqueous suspension of cells is intimately mixed with a lysis reagent by passage through a mixer, the mixer being a fluidic vortex mixer comprising a substantially cylindrical chamber with an axial outlet at the centre of an end wall of the chamber, and with at least two inlets at or near the periphery of the chamber, at least one inlet being substantially tangential so as to cause spiralling flow in the chamber, the chamber containing no baffles, and the dimensions of

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<sup>1</sup> The examiner has withdrawn a rejection of claims 2-3 and 8-10 in view of Wan and Bowe. These claims remain objected to, however, as dependent upon a rejected base claim.

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the mixer and the flow rates being such that the residence time of the cell suspension in the mixer is less than the time for lysis to be completed.

The prior art references relied upon by the examiner are:

Wan et al. (Wan)	5,837,529	Nov. 17, 1998
Bowe et al. (Bowe) European Patent	2,241,796A	Sept. 11, 1991

### Grounds of Rejection

Claims 1, 4-7 and 11-13 stand rejected under 35 U.S.C. § 103(a) for as obvious over Wan in view of Bowe.

We reverse this rejection.

### DISCUSSION

In reaching our decision in this appeal, we have given consideration to the appellant's specification and claims, to the applied references, and to the respective positions articulated by the appellant and the examiner.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the noted rejections, we make reference to the examiner's Answer for the examiner's reasoning in support of the rejection, and to the appellant's Brief for the appellant's arguments thereagainst. As a consequence of our review, we make the determinations which follow.

### 35 U.S.C. § 103

Claims 1, 4-7 and 11-13 stand rejected under 35 U.S.C. § 103(a) for as obvious over Wan in view of Bowe.

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). It is well-established that the conclusion that the claimed subject matter is prima facie obvious must be supported by evidence, as shown by some objective teaching in the prior art or by knowledge generally available to one of ordinary skill in the art that would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

We note that the examiner has withdrawn a rejection of claims 2-3 and 8-10 in view of Wan and Bowe. These claims remain objected to, however, as dependent upon a rejected base claim.

According to the examiner, Wan discloses a method for “processing cells comprising mixing cells with a lysis reagent and precipitating agent in a flow through mixer having no motion. The flow rate through the mixer is critical to the efficiency of the lysis, precipitation and mixing of the agents with the cells.” Paper No. 4, page 4. The mixer of Wan has a helical structure to cause the mixture to mix together in a turbulent flow. Id.

The examiner relies on Bowe for the disclosure of “a vortex having a chamber with a spiral or helical structure to increase flow rate of a fluid passing therethrough for purposes of mixing. The vortex chamber has a tangential inlet to create a spirally flow and an axial outlet located centrally of the chamber.” Id. The examiner finds that the

claimed subject matter differs from the disclosure of Wan in that “a vortex chamber is specifically utilized to carry out the claimed method of processing cells.” Id.

The examiner concludes (Paper No. 4, page 4):

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to substitute the static mixer of Wan et al. with the fluid vortex mixer disclosed by the UK Patent [Bowe] in order to obtain a method for processing cells using a fluidic vortex mixer. Clearly one of ordinary skill would have been motivated to provide for a flow through device having a helical structure as Wan et al. describes that the dimensions and flow of the cell suspension for purposes of cell lysis is critical to the process. A fluid vortex mixer possesses the same properties as any flow through device. Wan et al. clearly teach that any flow through device may be used as long as it is static or motionless. The UK Patent is silent with respect to whether or not the vortex mixer is static or motionless, however, in its teaching it clearly provides disclosure that the liquid or aqueous suspension spirally flows through the vortex indicating that there is no motion provided to support the vortex mixer but only that the fluid is allowed to flow through the device. Furthermore, residence time is suggested by Wan et al. in that the disclosure teaches that the dimension must be of appropriate length in order to provide enough contact time between the lysing agent and the cells to cause lysis during the passage through the mixer ... Clearly residence time is suggested, if not taught, by Wan et al. and that such time is required to be sufficient for cell lysis to be completed.

[Emphasis added.]

Appellant argues that “Wan et al. refer to a method of lysing cells in which a cell suspension and a lysis solution are passed through a static mixer (i.e., a pipe with stationary baffles) wherein the cells exit the static mixer lysed. An essential aspect of the Wan et al. process is that lysis **has finished** by the time that the cells have left the static mixer. Hence, residence time in the mixer must be sufficiently long to ensure that lysis has occurred. For example, they state that there must be 'enough contact time

between the lysing solution and the cells to cause the lysis of the subject cells **during passage through the mixer...**' (emphasis supplied). In the exemplary embodiments, the residence time is in the range of 4 to 52 seconds." Brief, page 6. Appellant concludes that in the method of Wan, "the cells exit the static mixer lysed", and thus it would reasonably appear that lysis has been completed during passage through the mixer. Brief, page 8; Wan, column 2, lines 4-7, 45-47, and column 4, line 19.

We do not find that the examiner has put forth sufficient evidence to support a prima facie case of obviousness. We agree with appellant that Wan does not disclose a method in which the flow rates are such that the residence time of the cell suspension in the mixer is less than the time for lysis to be completed, as claimed. In our view, the method and examples described in Wan require that the cells exit the static mixer lysed, and therefore Wan reasonably discloses a residence time in the mixer which is sufficient for lysis to be completed. In particular, in the example set forth at column 4 of Wan, the "cell lysate exited the second static mixer lysed." See also, Figure 1. The examiner as much as acknowledges this teaching of Wan, in the statement in Paper No. 4, page 4, wherein the examiner states that "[c]learly residence time is suggested, if not taught, by Wan et al. and that such time is required to be sufficient for cell lysis to be completed." We do not find that Bowe makes up for the failure of Wan to teach a method for processing cells wherein the dimensions of the mixer and the flow rates are such that the residence time of the cell suspension in the mixer is less than the time for lysis to be completed, as claimed.

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The rejection of claims 1, 4-7 and 11-13 under 35 U.S.C. § 103(a) for as obvious over Wan in view of Bowe is reversed.

CONCLUSION

We reverse the rejection under 35 U.S.C. § 103(a) of claims 1, 4-7 and 11-13 for obviousness over Wan in view of Bowe. As a result of this decision claims 1-13 are without rejection.

REVERSED

DEMETRA J. MILLS  
Administrative Patent Judge

ERIC GRIMES  
Administrative Patent Judge

LORA M. GREEN  
Administrative Patent Judge

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